Question 1. What is the IP address of www.cecs.anu.edu.au . What type of DNS query is sent to get this answer?

The IP Address is 150.203.161.98. The DNS query sent is **dig www.cecs.anu.edu.au A**

Question 2. What is the canonical name for the CECS ANU web server? Suggest a reason for having an alias for this server.

The canonical name for CECS ANU web server is rproxy.cecs.anu.edu.au. Reasons for having an alias is that it points to an "A" record for a server. Therefore, if the IP address of that "A" record ever changes, it only needs to be updated once rather than updating N number of separate records.

Question 3. What can you make of the rest of the response (i.e. the details available in the Authority and Additional sections)?

The Authority section contains a list of servers that have the authority to respond to the domain name of the given query.

The additional section provides further details on the list of servers in the authority section listing out their IPv4 and IPv6 addresses if they have any.

```
;; AUTHORITY SECTION:
cecs.anu.edu.au.        3337    IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.        3337    IN      NS      ns2.cecs.anu.edu.au.
cecs.anu.edu.au.        3337    IN      NS      ns4.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au.    3337    IN      A       150.203.161.36
ns3.cecs.anu.edu.au.    3337    IN      A       150.203.161.50
ns4.cecs.anu.edu.au.    3337    IN      A       150.203.161.38
ns2.cecs.anu.edu.au.    3337    IN      AAAA    2001:388:1034:2905::24
ns3.cecs.anu.edu.au.    3337    IN      AAAA    2001:388:1034:2905::32
ns4.cecs.anu.edu.au.    3337    IN      AAAA    2001:388:1034:2905::26
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Question 4. What is the IP address of the local nameserver for your machine?

The IP address of my local nameserver is 172.20.10.3

Question 5. What are the DNS nameservers for the "cecs.anu.edu.au" domain (note: the domain name is cecs.anu.edu.au and not www.cecs.anu.edu.au)? Find out their IP addresses? What type of DNS query is sent to obtain this information?

The nameservers of cecs.anu.edu.au are:

- ns2.cecs.anu.edu.au | 150.203.161.36 | 2001:388:1034:2905::24
- ns3.cecs.anu.edu.au | 150.203.161.50 | 2001:388:1034:2905::32
- ns4.cecs.anu.edu.au | 150.203.161.38 | 2001:388:1034:2905::26

The DNS query sent to obtain this information is **dig cecs.anu.edu.au NS**

Question 6. What is the DNS name associated with the IP address 111.68.101.54? What type of DNS query is sent to obtain this information?

The DNS name associated with the IP Address is webserver.seecs.nust.edu.pk

The DNS query sent to obtain this information is **dig -x 111.68.101.54**

Question 7. Run dig and query the CSE nameserver (129.94.242.33) for the mail servers for Yahoo! Mail (again the domain name is yahoo.com, not www.yahoo.com). Did you get an authoritative answer? Why? (HINT: Just because a response contains information in the authoritative part of the DNS response message does not mean it came from an authoritative name server. You should examine the flags in the response to determine the answer)

Examining the flags in the response, an authoritative answer was NOT returned. The flags that were returned in the response were QR, RD and RA. An authoritative answer was not returned as the CSE nameserver is not the one of the authority name servers for the Yahoo mail servers.

Question 8. Repeat the above (i.e. Question 7) but use one of the nameservers obtained in Question 5. What is the result?

There was no answer from this query and as such it was not an authoritative answer. This occurred because cecs.anu.edu.au nameserver did not contain any information on where to query to find Yahoo mail servers. As such the query stopped and there was no answer response.

Question 9. Obtain the authoritative answer for the mail servers for Yahoo! mail. What type of DNS query is sent to obtain this information?

Using one of the IP addresses in the authority section of Question 7, I queried dig @68.180.131.16 yahoo.com MX to find the authoritative answer.

Question 10. In this exercise you simulate the iterative DNS query process to find the IP address of your machine (e.g. lyre00.cse.unsw.edu.au). First, find the name server (query type NS) of the "." domain (root domain). Query this nameserver to find the authoritative name server for the "au." domain. Query this second server to find the authoritative nameserver for the "edu.au." domain. Now query this nameserver to find the authoritative nameserver for "unsw.edu.au". Next query the nameserver of unsw.edu.au to find the authoritative name server of cse.unsw.edu.au. Now query the nameserver of cse.unsw.edu.au to find the IP address of your host. How many DNS servers do you have to query to get the authoritative answer?

You must query 6 different servers in order to find the authoritative answer.

Question 11. Can one physical machine have several names and/or IP addresses associated with it?

Yes, a physical machine can have several names and/or IP addresses associated with it. Reasons why is that you can split services/applications between the different IP addresses e.g. clients can use one IP whilst staff and administrators can use a separate IP. Dividing the IP addresses also allows for bug testing / trying new features before releasing it on the public IP. Another reason is that you can store backups or restore your server if the system goes down.